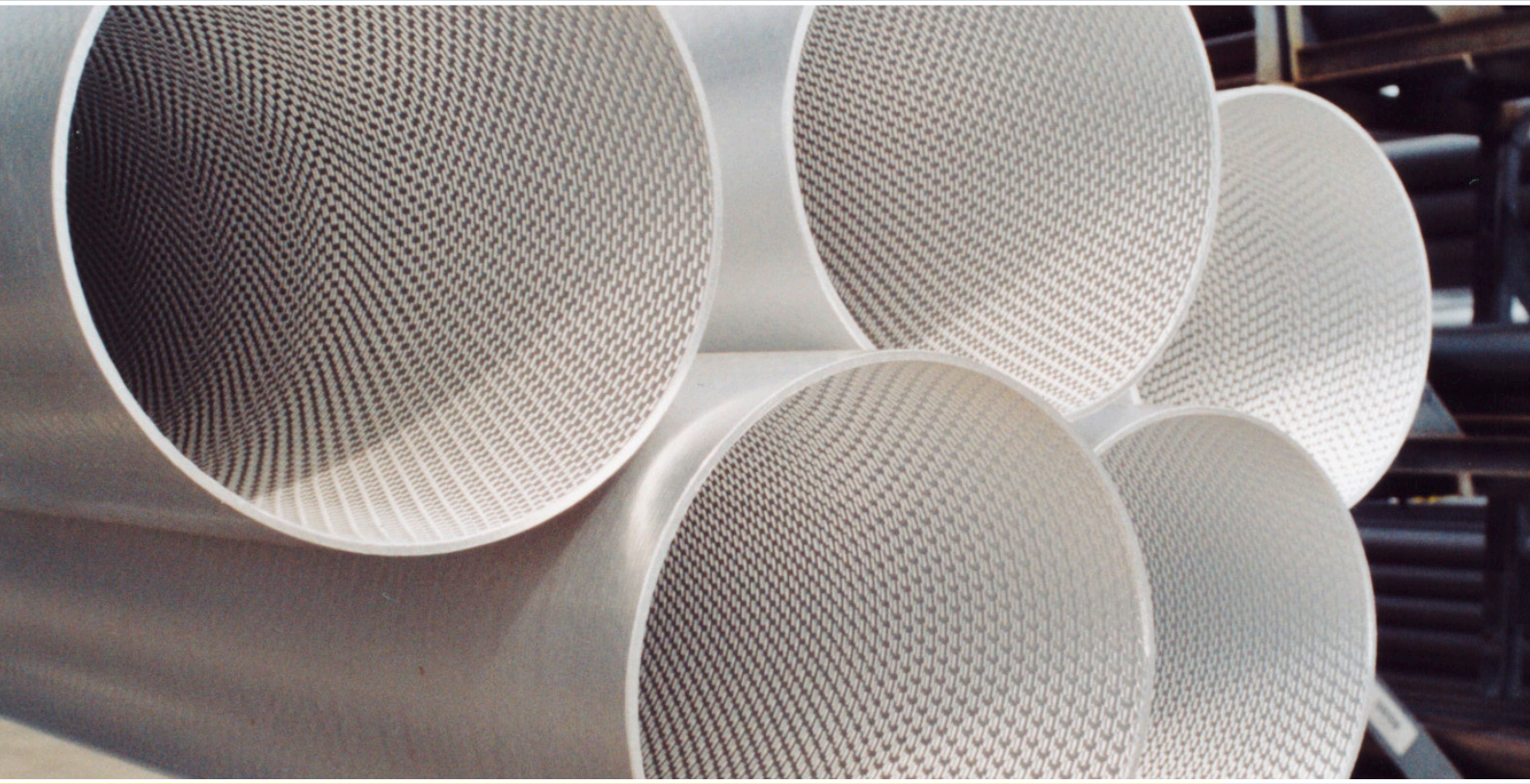


Pipework systems for pneumatic conveying

- Corrosion resistant pipes
- Clad pipes
- Special pipes and components ready for installation
- Spools and welded components
- Vessels, tanks and columns
- Assemblies

BUTTING

Efficient

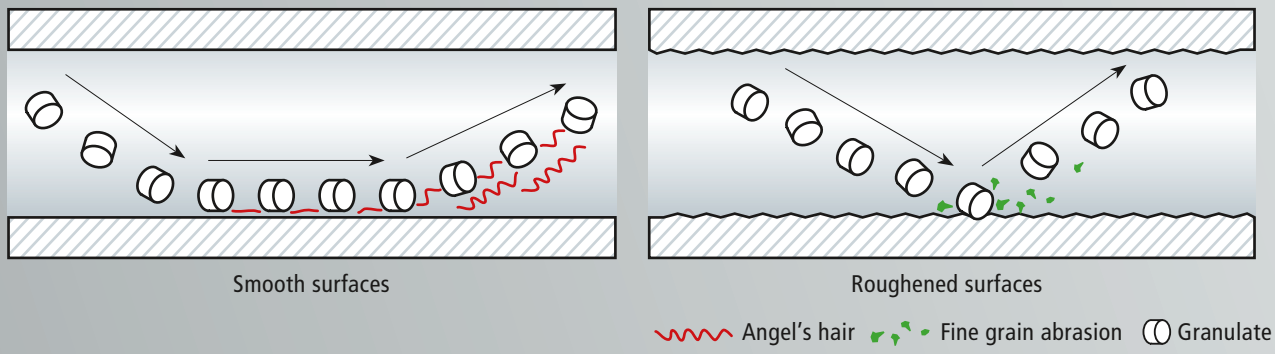
Today, pneumatic conveying systems are used in many industrial sectors to transport all kinds of bulk material. The list of materials to be conveyed ranges from pulverulent, large grain solids to small, complete shaped parts.
As conveying principles and the means of conveying have changed over the years, so have the requirements for pipework systems. BUTTING has taken on this task and developed special pipes, inner pipe surfaces and piping components in cooperation with the 'bulk material specialists'. Depending on the type and quantity of the conveyed material and the speed of conveyance, the required surface conditions of the pipework system vary, ranging from smooth to roughed-up. BUTTING uses a special process to achieve the defined degree of roughness of the inner surface. This is called 'roughening'.

From the loading bay to the processing plant, plastic granules are transported over several miles in pipes made of stainless steel and aluminium. When they come into contact with the smooth wall of the pipe friction pressure and increased temperatures can cause the granules to partially plasticise, resulting in the formation of a film and then a filament in the pipes and elbows. This can lead to losses of material and contamination and even a total blockage of the pipework. The aim is therefore to prevent the build-up of such 'angel's hair', which can be achieved by roughening the surface in a specific manner.

A key feature of the BUTTING process is the rough inner surface which prevents the formation of a film by the conveyed material. The contact of the conveyed material with the pipe is reduced thanks to turbulences in the boundary layer. This means that the transported material is conveyed smoothly and without causing damage and the pipe can be used for longer due to a significant reduction in wear and tear. The surface geometry prevents the forming of a filament or 'angel's hair'.

References

According to our customers the amount of 'angel's hair' was reduced by over 90 – 95 %. Self-cleaning systems take on this task now.
A significant number of renowned companies throughout the world, such as Coperion, Zeppelin, Formosa Plastic and Bühler, already rely on our expertise in conveying technology. An American bulk material technology company recently placed an order with BUTTING Canada to supply prefabricated pipes. A Canadian end customer is one of the leading manufacturers of plastics and chemicals. A number of different piping components was required to extend the production lines.



Smooth surfaces cause angel's hair – roughened surfaces cause fine grain abrasion, but no angel's hair

Production

Sizes

A conveyance system consists of various pipes. Due to the low operating pressure the walls of pipes used for pneumatic conveyance can be quite thin.
In addition to the standard sizes according to DIN EN, ISO and ASTM from DN 50 (2") to DN 300 (12"), BUTTING also stocks the intermediate sizes DN 175 (7") and DN 225 (9"). Depending on the project requirements, other sizes than those kept in stock and special sizes may also be produced.

Materials

Molybdenum-free materials are used based on cost-effectiveness if there are no extra demands on the mechanical or chemical properties. The material mainly used is AISI 304L and DIN EN 1.4541 (TP 321). However also certain end user rely on TP 316L or DIN EN 1.4571 (TP 316Ti).
For reasons of cost-effectiveness, pipework made from a combination of aluminium alloys and stainless steel may be used, where the product permits this. High-strength materials, such as duplex steel no. EN 1.4462/UNS S31803 (2205), should be used for conveyed materials which are prone to abrasion.

Long radius elbows

With pneumatic conveyance technology it is particularly important to use long radius elbows. The large radius reduces the effect of the collision of the granules with the back of the elbow, thus avoiding damage to the conveyed material and the pipe wall. This makes the conveyance both safer and cleaner. In addition, the long radius elbows reduce the separation of air and conveyed material caused by the transportation. The material is transported smoothly, thus avoiding clogging and any resultant loss of pressure.

Taking into account certain minimum bending radii, elbows from size DN 50 upwards can be formed in any radius and with any desired angle degree. Bending radii of five to ten times the pipe diameter are most common. Defined straight ends on one or both sides can be taken into account in production for pipe lengths of up to approx. 5800 mm (19.03 ft).

Inner surface

BUTTING supplies pipes and elbows made of hot-rolled raw material, without any further surface treatment, with roughening depths of approx. R_a 3.0 – 7.0 µm (118.11 – 275.59 µin). Pipes made of cold-rolled raw material are kept in stock in specific sizes with roughening depths ranging from R_a 0.5 – 1.6 µm (19.69 – 62.99 µin).

Defined roughness of the surface by special roughening process

	Inside diameter	Roughness ($R_{max.}$)	
		Stainless steel	Aluminium
Pipes	54.0 mm (min.)	40 – 70 µm	50 – 200 µm
	80.0 mm (min.)	150 – 300 µm	200 – 450 µm
Elbows	54.0 – 317.9 mm	40 – 70 µm	50 – 200 µm
	80.0 – 110.3 mm	150 – 300 µm	200 – 450 µm
	100.0 – 317.9 mm	70 – 150 µm	120 – 220 µm

No guarantee for correctness

Corrosion resistance

Corrosion resistance depends on the quality of the surface and the weld seams. At BUTTING, the pipes, elbows and pipework systems are subjected to a chemical treatment. This pickling process guarantees reliable results when it comes to the removal of ferritic contamination and welding colours.

Factory prefabrication

In order to ensure optimal surface quality and longevity of the complete pipework system, we recommend extensive factory prefabrication based on pipework plans and isometric drawings for which BUTTING can offer comprehensive support.

For you prefabrication means:

- improved welding and surface quality
- reduced maintenance and repair costs
- optimised usage of resources on site
- efficient, integrated construction site planning

BUTTING

The BUTTING family firm is one of the world's leading processors of stainless steels. Its range of services includes corrosion resistant pipes, special pipes and components ready for installation as well as prefabricated pipework and vessels. Its core skills lie in forming, welding and materials technology. For several decades BUTTING products have met and continue to meet the highest quality standards in pneumatic conveying technology in the world.

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